VIABILITY OF *PSEUDOMONAS AERUGINOSA*

A. EMMANOUILIDOU-ARSENI AND I. KOUMENTAKOU

Bacteriological Laboratory, Children's Hospital, Aghia Sophia, Athens, Greece

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Hospital cross-infection due to *Pseudomonas aeruginosa* is, at present, of increasing importance, particularly in children's wards where the percentage of susceptible patients is higher than in general wards. We present results obtained by studying the time of survival of *P. aeruginosa* under some common physical conditions.

A total of 50 strains of *P. aeruginosa* isolated from pus, feces, eye, nose, throat, and umbilicus were used. Each strain was tested as follows.

Sterile filter paper discs (0.3 mm in diameter) were impregnated with 0.015 ml of a standardized 24-hr broth culture of each *P. aeruginosa* strain. The discs were kept in a sterile petri dish at room temperature.

Amounts (0.5 ml) of the same broth culture were placed in eight tubes, each containing 9.5 ml of sterile water; 0.3 ml of this suspension corresponded to 0.015 ml of the original broth culture. Duplicate tubes for each strain were kept (i) in a deepfreeze, (ii) in a refrigerator, (iii) at room temperature, and (iv) in an incubator (37 C).

Every 10 days, one disc and 0.3 ml of the four suspensions were inoculated into broth; growth and production of pigment after 24 and 48 hr of incubation were recorded. The absence of growth was considered an indication of the death of the organism. Two successive subcultures were done for each "dead" suspension. Time of survival was taken as the number of days elapsed between the preparation of the discs and the suspensions and the first negative subculture.

All strains kept on filter paper and in a deepfreeze died within 10 to 150 and 20 to 120 days, respectively; those kept in suspension at other temperatures survived for more than 300 days (see Table 1). No correlation was found between time of survival and nature of source of isolation. However, the two most susceptible strains were isolated from the throat, and the two more resistant ones were from pus and feces. The production of pigment was effected more readily; 44 of the 50 strains kept on filter paper lost their ability to produce pigment in broth after 10 days of storage. The same strains continued to produce pigment when kept in water suspension.

We wish to note two points as a result of this work. From the hospital cross-infection point of view, it is evident that wet objects and liquids are more dangerous than dry ones. From the bacteriological point of view, there must be some essential alterations in the metabolism of *P. aeruginosa* under different physical conditions. The sublethal injury of Straka and Stokes (J. Bacteriol. **78**:181, 1959) and the nonlethal freezing injury of Arpai (Appl. Micr. **10**:297, 1962) are valuable contributions to the study of this point.

TABLE 1. *Survival times of Pseudomonas aeruginosa (50 strains)*

Time of survival	On filter paper at room temp	Suspended in water and kept in			
		Deep-freeze (−10 C)	Refrigerator (6–8 C)	Room temp (20–30 C)	Incubator (37 C)
days					
0–10	—	—	—	—	—
11–20	1	—	—	—	—
21–30	1	2	—	—	—
31–40	3	3	—	—	—
41–50	2	1	—	—	—
51–60	3	2	—	—	—
61–70	4	12	—	—	—
71–80	11	11	—	—	—
91–100	8	4	—	—	—
101–120	9	12	—	—	—
121–150	6	3	—	—	—
151–200	2	—	—	—	—
201–300	—	—	50	50	50
	50	50	50	50	50